|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Accelerated 7th Grade Math - Sequencing the Common Core Standards** | | | | |
| **Units** | **1** | **2** | **3** | **4** |
| **Rational Numbers and Exponents** | **Proportionality and Linear Relationships** | **Introduction to Sampling Inference** | **Creating, Comparing, and Analyzing Geometric Figures** |
| **Standards** | 7 NS 1  7 NS 2  7 NS 3  8 NS 1  8 NS 2  8 EE 1  8 EE 2  8 EE 3  8 EE 4 | 7 RP 1  7 RP 2  7 RP 3  7 EE 1  7 EE 2  7 EE 3  7 EE 4  8 EE 5  8 EE 6  8 EE 7 | 7 SP 1  7 SP 2  7 SP 3  7 SP 4  7 SP 5  7 SP 6  7 SP 7  7 SP 8 | 7 G 1  7 G 2  7 G 3  7 G 4  7 G 5  7 G 6  8 G 1  8 G 2  8 G 3  8 G 4  8 G 5  8 G 9 |
| **Supporting Materials** | 6.2  6.3  6.6  Include problem-solving from the text  6.4  6.5  4.7  6.7  **Course 3:** 9.2  **Course 3:** 1.4, 4.6, 4.7, 4.8  **Algebra 1:** 8.1  8.2  4.8 technology activity | 8.1  8.2  10.5 pg. 540, #17, #18  8.4  8.5 pg 428, #51  9.1-9.5 (pre-teach)  9.6  9.7  9.8  Include Pre-Ap material  6.7  7.2  7.3  7.1  6.6  7.3  7.4  7.5  7.6  Focus on problem-solving pg 369-370  11.2  11.6  11.8  11.7  11.7 investigations  **Algebra 1**: 7.5 | 3.4 vocab only  Khan Academy  3.1  13.1  3.1 extension  13.4 before 13.2  13.5 before 13.2  13.2 foundational skills only  13.3 foundational skills only  13.6 | 10.5 investigation  8.6  10.3  10.3 extension  10.4 no slicing  Use iCross or illumination  11.6 no derivation  11.7 no derivation  10.1 missing equations for unknown angles  10.2 missing equations for unknown angles  11.4  11.5  12.3 include investigations  12.5 include investigations  **Course 3:** 8.1-8.8  EFS materials  10.6  10.7  10.7 extension |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Accelerated 7th Grade Math - Sequencing the Common Core Standards** | | | | |
| **Units** | **1** | **2** | **3** | **4** |
| **Rational Numbers and Exponents** | **Proportionality and Linear Relationships** | **Introduction to Sampling Inference** | **Creating, Comparing, and Analyzing Geometric Figures** |
| **Vocabulary** | Positive  Negative  Opposite  Additive inverse  Absolute value  Integer  Rational number  Terminating decimal  Repeating decimal  Irrational  Power  Base  Exponent | Additive inverse  Absolute value  Integer  Rational number  Terminating decimal  Repeating decimal  Complex fraction  Linear expression  Coefficient  Like terms  Relation  Function  Domain  Range  Input  Output  Linear  X-intercept  Y-intercept  Slope  Rise and run  Rate of change  Slope-intercept form  Exponential  Quadratic | Sample  Population  Random sample  Representative sample  Centers  Variabilities  Mean median  Mean absolute deviation  Interquartile range  Measures of variability  Measures of center  Likely  Unlikely  Theoretical probability  Experimental probability  Relative frequency  Probability model  Uniform probability model  Frequency  Compound events  Sample space  Tree diagram  Outcomes  Favorable outcomes  Simulation | Scale Drawing  Right rectangular prism  Right rectangular pyramid  Radius  Diameter  Circumference  Area  Pi  Supplementary angles  Complementary angles  Vertical angles  Adjacent angles  Length  Width  Base  Height  Altitude  Surface area  Volume  Cone  Cylinder  Sphere  Angle  Similar  Congruent  Corresponding  Transformation  Image  Translation  Reflection  Dilation  Scale  Perpendicular  Parallel  2-D  Perimeter  Area  Base  Height |

**ACCELERATED 7th GRADE**

**8 Mathematical Practices**

* Make sense of problems and persevere in solving them
* Reason abstractly and quantitatively.
* Construct viable arguments and critique the reasoning of others.
* Model with mathematics.
* Use appropriate tools strategically.
* Attend to precision.
* Look for and make use of structure.
* Look for and express regularity in repeated reasoning.

| **Unit** | **Clusters** | **Standards** | **Material Alignment** | **Additional** |
| --- | --- | --- | --- | --- |
| **Unit 1**  **Rational Numbers and Exponents** | Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | **7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.  **a**. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*  **b**. Understand *p* + *q* as the number located a distance |*q*| from *p*, in the positive or negative direction depending on whether *q* is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.  **c.** Understand subtraction of rational numbers as adding the additive inverse, *p* – *q* = *p* + (–*q*). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.  **d.** Apply properties of operations as strategies to add and subtract rational numbers.  **7.NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.  **a.** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.  **b.** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If *p* and *q* are integers, then *–(p/q) = (–p)/q = p/(–q)*. Interpret quotients of rational numbers by describing real-world contexts.  **c.** Apply properties of operations as strategies to multiply and divide rational numbers.  **d.** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.  **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers.\* | 6.2  6.3  6.6  6.4  6.5  6.6  4.7  6.7  6.6 | Include problem-solving from the text |
|  | Know that there are numbers that are not rational, and approximate them by rational numbers. | **8.NS.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.  **8.NS.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., p2). *For example, by truncating the decimal expansion of* √*2, show that* √*2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* | **Course 3**: 9.2  **Course 3:** 9.2 | *HCPSS Worthwhile Math Tasks:*   * Discovering Pi   *HCPSS Worthwhile Math Tasks:*   * The Code Name Organizer   Patio Predicament |
|  | Work with radicals and integer exponents. | **8.EE.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, 32 x 3–5 = 3–3 = 1/33 = 1/27.*  **8.EE.2** Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.  **8.EE.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 x 108 and the population of the world as 7 x 109, and determine that the world population is more than 20 times larger.*  **8.EE.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. | **Course 3:** 1.4, 4.6, 4.7, 4.8  **Algebra 1**: 8.1, 8.2  4.8 technology activity  4.8  4.8 technology activity | *(lllustrative Mathematics)*   * Giantburgers * Extending the Definitions of Exponents Variation 1   *MAP website*   * Golden Crown   *From the 8th grade math adopted text:*   * P. 228 #3, 9, 15   *MAP website*   * 100 People   *From the Algebra 1 adopted text:*  P. 550 #3-7, 16, 19 |
| **Unit 2**  **Proportionality and**  **Linear Relationships** | Analyze proportional relationships and use them to solve real-world and mathematical problems. | **7.RP.1** *Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different*  *units. For example, if a person walks* 1/2 *mile in each* 1/4 *hour, compute the unit rate as the complex fraction* 1/2 */* 1/4 *miles per hour, equivalently 2 miles per hour.*  **7.RP.2** *Recognize and represent proportional relationships between*  *quantities.*   1. *D*ecide whether two quantities are in a proportional relationship, e.g., by testin*g for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.* 2. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.   **c.** Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*  **d.** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.  **7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns,*  *gratuities and commissions, fees, percent increase and decrease, percent error.* | 8.1  8.2  10.5  8.4  8.5  Not in text  9.1-9.5  9.6  9.7  9.8 | p. 540, #17, #18  p. 428 #51  p. 428, #57  Pre-teach 9.1-9.5  Include Pre-Ap materials  Pre-teach 9.1-9.5  Include Pre-Ap Activities |
|  | Use properties of operations to generate equivalent expressions. | **7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.  **7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities  in it are related. *For example, a + 0.05a = 1.05a means that “increase by 5%” is the same as “multiply by 1.05.”* | 6.7  7.2  7.3  7.1 | Lacks factoring |
|  | Solve real-life and mathematical problems using numerical and algebraic expressions and equations | **7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each*  *edge; this estimate can be used as a check on the exact computation.*  ***7.EE.4***Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  **a.** Solve word problems leading to equations of the form *px* + *q* = *r*  and *p*(*x* + *q*) = *r*, where *p*, *q*, and *r* are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*  **b.** Solve word problems leading to inequalities of the form *px* + *q* > *r* or *px* + *q* < *r*, where *p*, *q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.* | 6.6  6.7  7.3  7.4  7.5  7.6 | Focus on problem-solving p. 369-370 |
|  | Understand the connections between proportional relationships, lines, and linear equations. | **8.EE.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*  **8.EE.6** Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation *y = mx* for a line through the origin and the  equation *y = mx + b* for a line intercepting the vertical axis at *b*. | 11.2  11.6  11.8  11.6 extension  11.7  11.7 investigations | *(lllustrative Mathematics)*   * Cell Phone Plans * Compare Speed * Find the Change * Function Rules * Modeling with Linear Functions * Foxes & Rabbits   *Navigations Through Numbers and Operations book*   * Using Unit Rate to Solve Problems * Changing Rates * Proposing a Proportional Plan * Exchanging Currency * Getting a Grip on Graphs * Pouring Over Patterns   *From the 8th grade math adopted text:*   * P. 338 #1, 3, 4, 5, and 12-13   *From the Algebra 1 adopted text:*   * P. 694 #1 * P. 705 #11   *Use activities from the DMI class called “Examining Features of Shapes”* |
|  | Analyze and solve linear equations and pairs of simultaneous linear equations. | **8.EE.7** Solve linear equations in one variable.  **a.** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of  these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = *a*, *a* = *a*, or *a* = *b* results (where *a* and *b* are different numbers).  **b.** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. | **Algebra 1:** 7.5 | *Use activities from the DMI class called “Patterns, Function, and Change”* |
| **Unit 3**  **Introduction to**  **Sampling Inference** | Use random sampling to draw inferences about a population. | **7.SP.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.  **7.SP.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be. | 3.4 | Vocab only  Not in text  Khan Academy  Khan Academy! |
|  | Draw informal comparative inferences about two populations. | **7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variability, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.  **7.SP.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book. | 3.1  3.4  3.1 extension |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Investigate chance processes and develop, use, and evaluate probability models. | **7.SP.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.  **7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.  **7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.  **a.** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be elected and the probability that a girl will be selected.  **b.** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end  down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?  **7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.  **a.** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.  **b.** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.  **c.** Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood? | 13.1  13.1  Supplemental lesson needed  13.2 foundational skills only  13.3 foundational skills only  13.4 before 13.2 and 13.6  13.5 before 13.2 and 13.6  13.2  13.6 |
| **Unit 4**  **Creating, Comparing,**  **and Analyzing**  **Geometric Figures** | Draw, construct and describe geometrical figures and describe the relationships between them. | **7.G.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.  **7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.  **7.G.3** Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. | 10.5 investigations  8.6  10.3  10.3 extension  10.4 no slicing  Use iCross or illumination |
|  | Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. | **7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.  **7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.  **7.G.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | 11.6 no derivation  11.7 no derivation  10.1 missing equations for unknown angles  10.2 missing equations for unknown angles  11.4  11.5  12.3 include investigations  12.5 include investigations |
|  | Understand congruence and similarity using physical models, transparencies, or geometry software. | **8.G.1** Verify experimentally the properties of rotations, reflections, and translations:  **a.** Lines are taken to lines, and line segments to line segments of the same length.  **b.** Angles are taken to angles of the same measure.  **c.** Parallel lines are taken to parallel lines.  **8.G.2** Understand that a two-dimensional figure is congruent to another  if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.  **8.G.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.  **8.G.4** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.  **8.G.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. | **Course 3:** 8.1-8.8  EFS materials  *(lllustrative Mathematics)*   * Find the Missing Angle   Congruent Segments  *Use activities from the DMI class called “Examining Features of Shapes”*  *OPI – IEFA*   * Stars in the Sky * Making a Star Quilt * Native American Designs * Geometric Beadwork * Tipi Geometry & Trigonometry   *Navigating Through Algebra book*   * Rotational Symmetry and Regular Polygons * Using Scale Factors * Translations, Reflections, and Rotations * Reflection of Images * Dilating Figures * Congruent and Similar Shapes * Piecing Ideas Together   Pick’s Theorem |
|  | Solve real-world and mathematical problems involving volume of cylinders, cones and spheres. | **8.G.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. | 10.6  10.7  10.7 extension  *Use activities from the DMI class called “Examining Features of Shapes”*  *Navigating Through Geometry*   * Constructing Three- Dimensional Figures   *OPI – IEFA*   * Surface Area and Volume of Traditional American Indian Homes   *From the 8th grade math adopted text:*   * P. 574   P. 577 #3, 4, 13 |